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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,212	03/07/2001	Jyoti Kiron Bhardwaj	WLJ.071	4027

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VOLENTINE FRANCOS, & WHITT PLLC
ONE FREEDOM SQUARE
11951 FREEDOM DRIVE SUITE 1260
RESTON, VA 20190

EXAMINER

DEO, DUY VU NGUYEN

ART UNIT	PAPER NUMBER
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1765

DATE MAILED: 01/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/744,212	Applicant(s) BHARDWAJ, JYOTI KIRON	
	Examiner DuyVu n. Deo	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10, 13-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Laermer et al. (US 5,501,893) and admitted prior art.

Laermer describes an etching method for comprising repeatedly performing the steps: etching a material using a plasma (col. 3, line 68); depositing a passivation layer on the surface of the etched feature (col. 4, line 26). The second etching step would selectively removing the passivation layer from the base of the etched feature in order that the etching proceeds in a direction perpendicular to the material (col. 4, line 54-56). This would read on claimed step c partially removing the passivation from the surfaces of the etched feature in order the etching of subsequent etching process cycles proceeds in a direction substantially perpendicular to the film surface. Also the second step would be a separate and distinctly from the first etching step of the cycle since it also remove the passivation layer.

Unlike claimed invention, Laermer doesn't describe at least one of steps etching and depositing is performed in the absent of a plasma. However, other alternative ways of etching such as wet or vapor etching, using HF and alcohol, and depositing such as a plasma or energetic

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radiation (absent of plasma) is well known to one skilled in the art as discussed in pages 1, 3, and 4 of the specification. Therefore, at the time of the invention, using other technique for etching including wet, vapor etching or depositing such as energetic radiation (absent of plasma or photo-enhanced polymerization) would have been obvious in order to etch a substrate and deposit a passivation layer with a reasonable expectation of success.

Referring to claim 13, using nitrogen for purging between steps or as a gas carrier is well known to one skill in the art (please see cited arts below).

Referring to claim 16, the polymer would be of the formula since the gases using contains C and F such as CHF₃ (claimed precursor). Referring to claim 18-20, page 4 of specification further describes the photo-enhance polymerization and by means of irradiation which are known and practiced by one skilled in the art. Referring to claims 21, 23, the ion energy such as 10eV would have been obvious to be determined through test runs and the etching gases (col. 6, line 11-20) would be capable of physically removing the passivation layer with chemical enhancement.

3. Blackwood et al. (US 4,749,440), col. 4, line 68-col. 5, line 2, and Cleavelin et al. (Semiconductor International Nov. 1987), pg 96, are cited to show prior art.

Claim Rejections - 35 USC § 112

4. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what is meant by step is performed distinctly from step a and b.

It is unclear to what step of the process the processing parameters of claim 26 referring to, a, b, or c step. At this time, claim 26 has not been considered under prior art because of the above indefiniteness.

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. applicant has not shown where and how the specification teaching of the step c is performed distinctly from step a and b.

Response to Arguments

7. Applicant's arguments filed 11/8/05 have been fully considered but they are not persuasive.

Referring to applicant's argument that Laermer doesn't describe a three-step process of claim 1, Laermer describes repeating etching and depositing step; therefore, it must have at least 4 steps. Furthermore, the second etching step to remove the passivation would read on claimed step c because it is a separate step from the first etching step and the depositing step and it is a distinctly step from the first etching and depositing step because it also removes passivation layer.

It appears that applicant argues the unexpected result that performing at least one plasmaless step with other plasma based or plasmaless steps would achieve highly anisotropic etching. In the absence of the unexpected result, at this time, all these plasmaless and plasma processes are known to one skilled in the art at the time of the invention; therefore, using any of these techniques would be obvious in order to form a device structure with a reasonable expectation of success.

Referring to claim 16, applicant has not shown how CHF_3 would not form any polymer of formula $\text{n}(\text{C}_x\text{F}_y)$, where x and y are suitable values. The polymer might not be made up entirely of pure $\text{n}(\text{C}_x\text{F}_y)$; however, since it contains C and F, it would form some of polymer that contain $\text{n}(\text{C}_x\text{F}_y)$, where x and y can be any suitable values.

Allowable Subject Matter

8. Claims 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 11, 12 are allowable because applied prior art doesn't suggest that material or film being etched is a conductor, preferably an Au or Pt conductor. Primary reference, Laermer, describes etching silicon.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n. Deo whose telephone number is 571-272-1462. The examiner can normally be reached on 6:00-2:30 Mon-Fri.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Primary Examiner

Duy-Vu N. Deo

1/10/06

